

## 2.4 Square Root Property & Solve by Factoring

### Solving Quadratic Equations using the Square Root Property

Ex1:

$$x^2 = 81$$

$$x = \pm \sqrt{81}$$

$$x = \pm 9$$

$$\sqrt{48}$$

Ex2:

$$4a^2 + 11 = 7$$

$$4a^2 = -4$$

$$a^2 = -1$$

$$a = \pm \sqrt{-1}$$

$$a = \pm i$$

Ex3:

$$(2y + 1)^2 = 12$$

$$2y + 1 = \pm \sqrt{12}$$

$$2y = -1 \pm 2\sqrt{3}$$

$$y = \frac{-1 \pm 2\sqrt{3}}{2}$$

$$\left\{ \frac{-1 + 2\sqrt{3}}{2}, \frac{-1 - 2\sqrt{3}}{2} \right\}$$

Ex4:

$$\frac{2}{x} = \frac{x}{9}$$

$$18 = x^2$$

$$x = \pm \sqrt{18}$$

$$x = \pm 3\sqrt{2}$$

## Solving Polynomial Equations using the Product Property

Ex5:

$$2x^2 + 6x + 4 = 0$$

$$2(x+2)(x+1) = 0$$
$$x+2=0 \quad | \quad x+1=0$$
$$x=-2 \quad | \quad x=-1$$

Ex6:

$$9b^3 + 5b^2 = 4b^2$$

$$9b^3 + b^2 = 0$$

$$b^2(9b+1) = 0$$

$$\cancel{b^2} = 0 \quad | \quad 9b+1=0$$

$$b=0 \quad | \quad 9b=-1$$

$$b = -\frac{1}{9}$$

$$\left\{ 0, -\frac{1}{9} \right\}$$

Ex7:

$$z^4 + 3z^3 - 4z^2 - 12z = 0$$

$$z[z^3 + 3z^2 + (4z - 12)] = 0$$

$$z[z^2(z+3) + 4(z-3)] = 0$$

$$z(z+3)(z^2-4) = 0$$

$$z(z+3)(z-2)(z+2) = 0$$

$$\{-2, -3, 2, 0\}$$

HW pg 118 1,2,5-16 all & pg 136 7-10 all

Unit 8

Day 2

Completing the Square

Example 6

Find the value of  $c$  that completes the square:

$$x^2 + 8x + c$$
$$(8 \cdot \frac{1}{2})^2$$

$$c = 16$$

$$x^2 + 8x + 16$$

Example 7

Find the value of  $c$  that completes the square:

$$x^2 - 4x + c$$
$$\left(\frac{1}{2} \cdot 4\right)^2$$
$$c = 4$$

Example 8

Find the value of  $c$  that completes the square:

$$x^2 + \frac{1}{3}x + c$$
$$\left(\frac{1}{3} \cdot \frac{1}{2}\right)^2$$

$$c = \frac{1}{36}$$

Example 9

Find the value of  $c$  that completes the square:

$$x^2 + \frac{1}{2}x + c$$

$$\left(\frac{1}{2} \cdot \frac{1}{2}\right)^2$$

$$c = \frac{1}{16}$$



Goal is to create a perfect square trinomial that has a lead coefficient of 1.

1)  $x^2 + 10x + 17 = 0$

$$x^2 + 10x + 25 = -17 + 25$$

$$(x+5)^2 = 8 \quad \Leftarrow$$

$$x+5 = \pm \sqrt{8}$$

$$x = -5 \pm 2\sqrt{2}$$

2)  $3a^2 + 12a + 2 = -16$

$$\frac{3a^2 + 12a}{3} = \frac{-18}{3}$$

$$a^2 + 4a + 4 = -6 + 4$$

$$(a+2)^2 = -2$$

$$a+2 = \pm \sqrt{-2}$$

$$a = -2 \pm i\sqrt{2}$$

$$3) \quad n^2 - 9n + 15 = 8$$

4)  $2y^2 - 3y + 8 = 0$

$$\frac{2y^2 - 3y}{2} = \frac{-8}{2}$$

$$y^2 - \frac{3}{2}y + \frac{9}{16} = -4 + \frac{9}{16}$$
$$\frac{-64}{16} + \frac{9}{16}$$

$$\left(y - \frac{3}{4}\right)^2 = \frac{-53}{16}$$

HOMEWORK

Unit 8 Day 2

p. 118: 17-22 (all)